

Flightfax

ARMY AVIATION
RISK-MANAGEMENT
INFORMATION

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In this issue of *Flightfax*, we have compiled several historical articles on weather risk management to help you answer that age-old aviation question.

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Next month's issue: Power management issues



Recipe For Disaster

"Well, that would never happen to ME!"

This is a true story written by a senior warrant officer. It's full of food for thought about a lot of things: about weather; about cockpit communication; about aircrew coordination; about speaking up, giving in, giving up—about saying "Enough"; about mission at all costs, about unnecessary risk; about judgment, about lack of it; and about craziness—and how good aviators can let themselves get caught up in it.

We don't know that these guys were doing anything **illegal**, but they certainly were doing things that were **imprudent**. Luck is all that got them back alive.

We've all heard it. Most of us have said it—maybe a couple of times.

It happens when we hear a "war-story"—or read an account in *Flightfax*—about some tragic, scary, or incredibly stupid experience in aviation. Our bluster is kind of a posturing—deflecting possible notions by peers that chinks might exist in our armor.

But how many of us have actually been present as one of these aforementioned events unfolded? How many have actually sat there watching things get stupider and stupider? And it's you sitting there. And you find yourself essentially powerless to do anything.

I'm here to tell you that, despite aircrew coordination training, despite the "Two-Challenge Rule," despite *anything*, it *can* happen and it happens

every day.

My tale begins in the jungles of Central America—the Last Mission of the Last Day of a 6-month road- and school-building operation. The pilots were two senior W4s: one, an IP, PC, and UH-60 operations officer who'd been in-country for the entire operation; the other, me, at the end of my second 2-week deployment.

A Chinook was scheduled to extract a group from a hillside LZ, but the aircraft developed maintenance problems. Ops decided our UH-60 would try to do it. But it was the rainy season, and the afternoon torrent had already begun.

With it coming down faster than an inch per hour, visibility was nearly nonexistent as we cranked, and water poured into the cockpit from various leaks.

Nevertheless, the PC thought we might make it to the pickup point by slowly working our way up the river that ran by our base camp. We crept off the ground, our young—and now drenched—crew chief clearing us past mist-shrouded trees.

We picked our way along in intense rain with the ceiling defined by getting high enough into the shower to lose sight of the ground. I remarked that it didn't seem like a very good idea to try and get through in these conditions, but the PC told me he'd seen worse. I suggested we try a route along the nearby coastline since shower activity looked to be minimal there. He agreed but wanted to press on in case we could skirt everything via the river. Then the FIRE light came on.

False alarms are common in

heavy rain. We checked for smoke or other evidence of fire and no one was surprised that nothing was wrong. Moments later, the FIRE light went out.

We continued, conditions worsening and visibility decreasing—as low as a hundred feet or so in some of the heavier downpours. Even with the windshield wipers flailing at their highest speed, navigation was treetop-to-treetop at best. I told the PC this *still* didn't seem like a wise thing to do and he sort of agreed, admitting it didn't look good to him either. The FIRE light popped on again and went out.

This prompted us to turn around. Then the FIRE light came on and stayed on. Concerned, I suggested we call this whole thing off, but he now wanted to try the coast and asked if either of us had a problem with doing that. Considering that the crew chief and I both knew the FIRE light was a false alarm and the coast looked a lot better, we reluctantly assented.

Toward the coastline, we immediately broke out of the heavy rain, and the FIRE light disappeared. We headed along the fringe of the rain activity to try and find a spot to get through.

But it quickly became obvious that this shower was massive: a solid wall running through the hills for many miles. As we continued, conditions worsened again; the downpour resumed, and visibility in the direction we needed to go dropped to zero.

Suddenly, our PC turned out to sea, heading for an island about 5 miles across open water, telling us his plan was to follow a string of islands and try to reach the pickup point that way. In driving rain, at an altitude of about 500 feet above the water, without floatation gear, no navigational receiver or GPS, a

marginal-at-best tactical radio, and no map, I felt like we'd been hijacked. Only I couldn't squawk 7500 because the transponder didn't work either. And besides, what the *hell* were we doing in heavy rainshowers at 500 feet and more than 2 miles from the nearest patch of solid ground? I told him I had genuine reservations about continuing.

"No problem," he told me as we followed the islands back toward the Great Wall of Weather. He'd been here 6 months, he said, and knew exactly where he was. I told him that might be true, but I still didn't have a good feeling for where we were. He lamented that people sent down here didn't get the opportunity to become as familiar with the area as *he* was.

He began describing landmarks visible here and there and insisted he knew where he was. I told him none of that would matter if we got stuck behind some ridgeline. He pointed out that we had plenty of fuel.

As we continued, I imagined someone reading the account of this foolish misadventure as part of an accident report. Suddenly, all the unbelievable, fact-filled reports I'd read assumed a new reality—it was *me* being drawn ever deeper into deadly absurdity by some individual apparently obsessed with accomplishing a mission. Remembering my aircrew coordination training, I again told him I was genuinely uncomfortable with what we were doing and that we should turn back. No response. ("Two-Challenge Rule" scoffers take note: *YOU* get into a cockpit fight under these conditions!)

Back on the mainland, we felt our way through the torrent, poking around hilltops until he decided this approach wouldn't work after all. To my—and I'm

sure our crew chief's—utter relief, he headed back toward the bay and more open conditions.

But as we continued homeward, he spotted an opening and decided to follow it. I told him again how uncomfortable I was with doing this—the Cold War was over and there were no Russians chasing us. He chuckled as we followed the cloud-obscured ridgeline until finding a tiny hole.

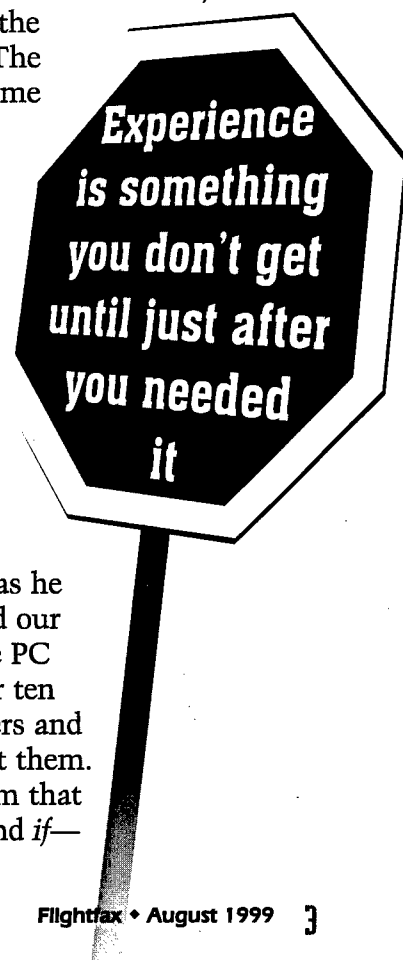
He dropped over it despite my warnings about its volatility. No problem; we could always find another way out.

Now inside the ridgeline and committed to a yet *more* intense adventure, he joked about our spending the night at the remote camp. Nobody laughed.

Following a dirt road and a few treetops, we located the edge of a village and picked up the road our Task Force had built. We traced it up the mountain, slowly ascending through the downpour toward the ragged cloud bottoms. The LZ came into view just beneath the

ceiling. The PC gave me the controls and I landed.

Our contact was "Shark Fin 07," and the radio operator sounded amazed as he answered our call. The PC asked for ten passengers and they sent them. I told him that once—and *if*—



we got back, that was *it* for this day as far as I was concerned. Sensing by now that I was somewhat troubled by the enormous amount of unnecessary risk this mission represented, he told the radio operator this would have to be our only load. The radio operator assured us that was okay; because of the weather, they'd already set up rides back to the base camp for everyone via ground vehicle anyway. He thanked us for our efforts.

Loaded up, I pulled in power to find our rotor in the clouds. The PC took the controls. He'd spotted some trees down the hillside and headed for them. We began picking our way back along the base of the ridgeline, now looking for an escape.

As we approached what looked to be a hole, I angrily told him I thought what we were doing was foolish and absolutely unnecessary, that we now threatened the lives of ten innocent people in addition to our own. The crew chief, who had been keeping quiet all this time, came on the intercom to say he wanted out when we got back.

The hole turned out to be a

good escape, and we dove for it. All at once, visibility improved and we headed back. He gave me the controls again. He'd proved he could "accomplish the mission." And he'd certainly impressed me.

We got down, and all I wanted was out. After shutdown, I grabbed my gear and stormed off in the still-pouring rain, more angry at myself than anything else.

Stupidly, I had let myself be drawn under the control of someone with an obsessive compulsion to "accomplish the mission" regardless of risk. What happened to myself and the crew chief is the very stuff I "tsked" about when reading accounts of events leading up to accidents. It will never happen again.

Every day during my deployment, I'd posted a "Thought for the Day" in Flight Ops; that day's was: "Experience is something you don't get until just after you needed it." Apparently, I'd missed my own point.

I had a long talk with the aviation OIC but to little avail; after all, the operation was over now. The next day, I took the ops officer/IP/PC aside for a half-hour discussion about how stupid it

had been: I was lucky because *he* was lucky; how would he like his excessive motivation to be responsible for killing a bunch of innocent people? I think he listened. Or perhaps he didn't.

What might have prevented the whole debacle would have been a serious pre-mission brief stressing risks, controls, and the criticality of continually verifying *everyone's* desire to continue. Plying a razor-thin line between treetops and cloud-bottoms is hardly the place to discover your PC has flushed everything he learned in aircrew coordination training. And that seems the most important lesson, since in today's "can-do," "Hooah!," "good-to-go" world, excessive motivation increasingly replaces calm and considered judgment.

And, sorry, but I don't want to hear, "Yeah, well *I* woulda took them controls!" or "*I* woulda put it on the ground right then and there!" or any other armchair quarterback chin music. Like any genuine war-story, you had to *be* there.

And remember too: This guy is *still* out there.

—Anonymous. Reprinted from *Flightfax*, November 1996.

Thunderstorms: A primer

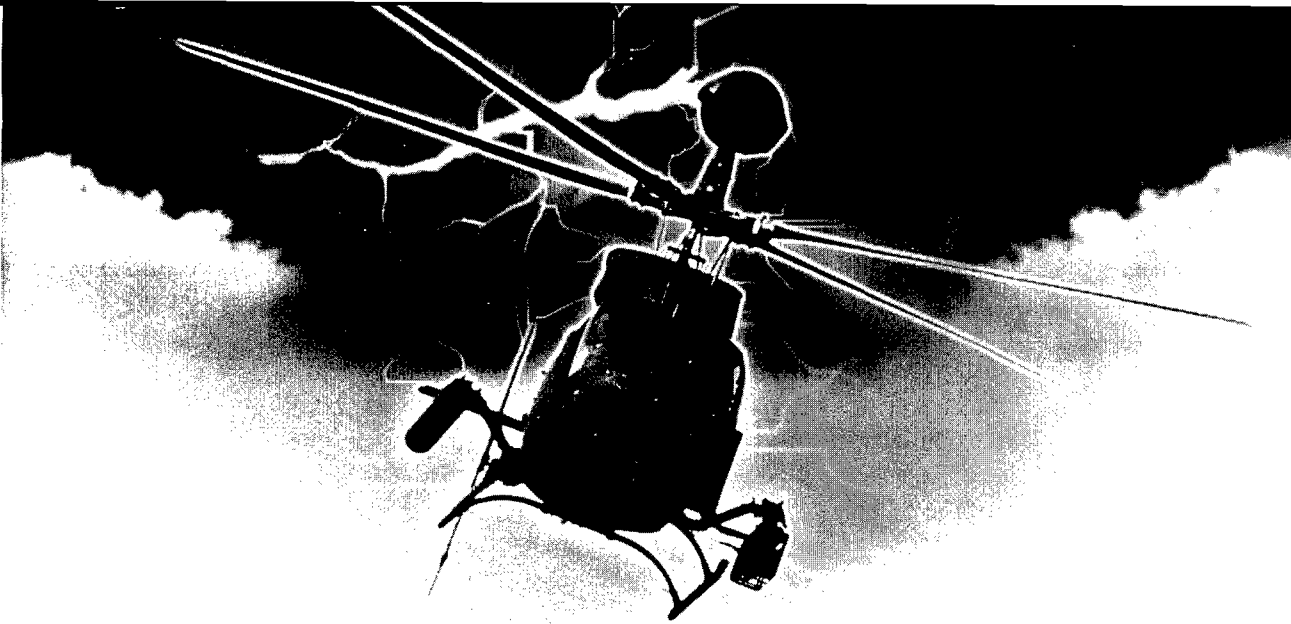
What is a thunderstorm? Simply stated, it's a storm that generates lightning and thunder. But it's also capable of generating a lot more, including high winds, hail, flash flooding, and tornadoes.

During their formative stage, thunderstorms are characterized by strong updrafts that can force the storm to a height of more

than 60,000 feet. Moisture in the lowest levels of the atmosphere becomes the fuel that fires up the thunderstorm development process. As tiny moisture particles are forced upward, condensation causes them to develop into droplets. As they collide with other droplets, they merge and grow in size. When they become too large for the updrafts to

support, the droplets begin to fall. This falling precipitation creates a **downdraft**.

As the downdraft reaches the surface, it produces a diverging pool of cool air, which becomes the **gust front** or **downburst**. A downburst with winds extending 4 kilometers or less is known as a **microburst**. Microburst, and its accompanying



(light • ning bolt)

...an electric discharge that can have a current as great as 100,000 amperes.

A charge of this magnitude can damage an aircraft's fuselage and electrical components; it could even cause fuel combustion.

wind shear (rapid changes in windspeed or direction) can be difficult to detect and predict because of its small scale and short lifespan.

On a larger scale, one of the most potentially severe events is the **squall line**. The squall line is a line of thunderstorms that can form along a front or develop 100 to 300 kilometers ahead of it. The mechanism for this event is the angle of the wind flow at about 10,000 feet. A wind flow aloft that is parallel to the front will generally keep most squall-line activity along the front. However, a perpendicular flow can cause squall-line development well ahead of the advancing frontal system. As the thunderstorms in the line develop downdrafts, downbursts may generate new thunderstorms ahead of the squall line. As the advancing downburst winds advance, they may force warm, moist air aloft ahead of it, generating a new squall line.

Strong upper-level wind flow may cause individual thunderstorms to develop rotation in their core. If a large-enough portion of the core is rotating, it's called a **mesocyclone**. Within the mesocyclone, there may exist a smaller, more intensely rotating

updraft that can lead to the birth of a **tornado**. This violently rotating column of air descends from the base of the storm, at which point it takes on its familiar appearance. If the tornado, with its windspeeds of more than 180 knots, doesn't reach the ground, it's called a **funnel cloud**.

One of the greatest threats to aviation is that of **lightning**. As a thunderstorm develops, an electrical charge builds up in the cloud. The exact cause of this electrification is unknown, but what is known is that unlike charges attract each other. The manifestation of this attraction is the lightning stroke (or bolt), an electric discharge that can have a current as great as 100,000 amperes. A charge of this magnitude can damage an aircraft's fuselage and electrical components; it could even cause fuel combustion.

Most lightning strikes to aircraft occur near the freezing level during ascent and near the tops of thunderstorms in level flight. As an aircraft flies through the air, it develops a charge, which in turn could attract an opposite charged lightning strike. The use of composite materials in aircraft

skins increases the buildup of a charge during flight, increasing the probability of attracting a lightning strike.

One final phenomenon associated with thunderstorms is **hail**. As the updrafts in the storm carry moisture aloft past the freezing level, water droplets freeze into ice. As these ice particles are held aloft, they pass through areas of moisture and acquire further coats of ice. This process continues until the ice buildup makes the particle too heavy to be supported aloft, and it falls. This falling particle is hail, which could be encountered aloft during flight even in areas where the freezing level is high enough that the hail melts before it hits the ground.

Despite all the recent advances in technology, there are still limitations to what can and cannot be done to support aviation when it comes to thunderstorms. Even with Doppler weather radar and new lightning-detection capabilities, the oldest axiom still applies—avoidance is still the best rule to live by.

—MSG Ray O'Brien, U.S. Air Force Weather Service, Fort Rucker, AL, DSN 558-8270 (334-255-8270). Reprinted from *Flightfax*, August 1997.

WAR STORIES

Gremlins lurking in the weather office?

It was mid July, and I was to fly an OH-58 out of a commercial airport in the Midwest. As I headed out to the ramp, I noticed the sky darkening far to the northwest. My weather brief was about 30 minutes old, so I decided to go back inside and get an update. I called Flight Service at 1700 and was told that an AIRMET had been issued for thunderstorms. The prediction was that these storms would not arrive at my location before 2200. The controller then added, "It may get there a little sooner than forecast, but you should have at least 2 to 3 hours."

As we took off at 1715, I looked to the northwest and saw black clouds. It was difficult to tell how far away they were, but they seemed a little closer than they had been at 1700. A few minutes later, my crew chief asked, "How far away does that storm look to you?" I looked around; it was definitely closer now. I replied, "Too close!"

The storm cloud was black, and we could now see that it was spitting lightning rapidly. The tower confirmed that it was headed toward the airfield from which we had just taken off and "closing rapidly." I notified the tower that we wished to land ASAP. At that point, we were 1 to

2 minutes from the airfield. I glanced at the clock; it was now 1737. It had been only 22 minutes since we took off.

What had happened to the forecast 5 hours and the assured minimum of 2 to 3 hours we would have before any foul weather appeared? As we approached our landing spot, we could see what looked to be horizontal tornadoes of dust spooling across the plowed fields to the northwest. We landed and dropped off our passenger without shutting down.

The storm had a forward-sloping leading edge, which, at a few thousand feet AGL, had already passed over us by a couple of miles. We took off into the wind and built up airspeed and altitude before turning downwind and away from the approaching storm. We set maximum endurance airspeed power for possible turbulence penetration.

We continued flying out from underneath the upper leading edge of the storm for 3 or 4 minutes. There was only light turbulence and no rain or visibility restrictions. The leading edge seemed to be getting higher and higher above and further behind us and we were breaking out into clearer skies. I set cruise power. It looked as though we had outrun the storm and had a clear path back home.

Just then, we abruptly encountered turbulence that was as strong as any I have ever encountered in a helicopter. We were at about 1100 feet AGL.

I reduced torque back down to that for maximum endurance airspeed for turbulence penetration and no less. The engine governor was already struggling with N2 upper excursions in this turbulence.

And then we were out of it. It

was gone as suddenly as it had appeared.

It all turned out well, but what can we learn from this experience? The way I see it is that we pilots can get into enough trouble on our own without being lured into false security and poor decision making by inaccurate and incomplete weather information. It's a given that we cannot expect perfection in weather forecasting, but we should be able to expect a reasonable degree of accuracy on forecast weather. And we should expect **very** accurate, detailed, and complete reporting of **current** weather conditions.

Weather is a realm of constant, ongoing change and evolution. Forecasts are continually becoming present weather. Current weather is moving elsewhere—and usually evolving into something different as it moves along.

What we can do to reduce the risks inherent in ever-fluctuating weather is to make the very most of new-generation Doppler radar and satellite coverage. It is, fortunately, becoming widely available at flight facilities across North America. This on-line weather service allows us to "visualize" weather. Its time-motion sequence enhancements and wide variety of other tools enable us to be as thorough as we wish to be in obtaining weather information.

We should be cautious and skeptical anytime we must receive a weather briefing solely by telephone or radio. In such cases, we should ask a lot of questions. If we have even the slightest doubt about the briefing, we shouldn't hesitate to call the nearest military weather office—even if it is some distance removed from our location. Our first choice should be to get a genuine "full-

service" military weather briefing. If that's not possible, we should try to get input from more than one source. This is not "shopping for weather" if we remain suspicious and promote a mindset that the worst forecast is probably the most accurate.

—CW4 Don C. Thomson, Missouri ARNG, DSN 555-9330/9347 (573-526-9330/9347).
Reprinted from *Flightfax*, July 1997.

Communication: Live by the word, die by the word

We all know that military aviation is an inherently dangerous business. Having been in the "business" for a little over 18 years, I've witnessed many of those dangers. Sometimes, however, we experience luck and the danger passes with no damage to personnel or equipment (or both). During my career in aviation, I've noticed that mishaps have a single common thread that not only links the results, but could have prevented the mishaps in the first place.

Of course, that link is communication. If you think of all the situations leading up to a mishap, you can pinpoint a breakdown (at some point) in communication. A breakdown in communication is usually the first hazard that creates a chain of events, a chain that ultimately leads to a mishap.

I'm reminded of my experiences as a junior aviator and what I've learned from many close calls while flying attack helicopters. Recently, I was going through some pictures of fellow aviators I once flew with. One of those pictures was of a brand-new pilot assigned to our unit just

before we deployed for a 30-day field exercise at Fort Irwin, CA. As one of the unit's new trainers, I was assigned the new guy as a copilot. He was not only young but seemed to be somewhat of an introvert (unusual for the attack-helicopter community). Every day we flew together, I wanted to teach him something new and valuable that would make him not only good, but safe! We spent our battle drills working on crew-coordination techniques, tactics, and other tools to improve our proficiency. That one aspect of his personality, shyness, never seemed to surface during our flights. My assumption was that he left that on the flightline when he climbed in the aircraft. This assumption was the beginning of a breakdown in communication that nearly cost us our lives and the lives of another aircrew.

We were flying a Combined Arms Team battle drill. Our mission was to fly to a battle position (BP) with three other AH-1s. We had 2 Scout helicopters with us that provided oversight, command and control, and other routine services. As we entered the BP we had maneuver room and set about getting the best observation position for unmasking and locating the armor targets we knew would be entering the "kill zone." As we maneuvered, I was unaware that one of our Scout helicopters had landed (to our 5 o'clock) and was waiting for commo from another battle captain. My new guy (in the front seat) saw the Scout land, and he assumed that I had seen it as well. Unfortunately, my eyes were trained in the direction the enemy was expected to come from, and my scan was limited to that side of the aircraft (opposite the Scout). As we slowly hovered at 10 feet agl, something didn't

feel right, and I increased power to gain about 10 additional feet. As I did, something caught my peripheral vision. The two pilots from the Scout were looking up at us as they ran away from their aircraft, ***which I now saw below our own landing skids.*** Our skids cleared their main rotors by no more than 5 feet as we flew directly over them! The Scout pilots knew it was too late to get our attention with a radio call, so they bailed. As I cleared their main rotor with our aircraft, my terror was replaced by sheer anger at my copilot, who seemed to be enjoying the whole ordeal. My first words to him were, "Did you see that aircraft?" He said he had and didn't say anything to me because he thought I saw it too. I was livid.

We landed and shut down our aircraft. I quickly approached the Scout pilots and apologized, explaining the problem. They were just happy I had my "psychic friends" along that day when I decided a 20-foot hover felt safer (just prior to impacting their aircraft). My new guy and I had a long talk about never assuming anything while in the cockpit. I told him that our breakdown in communication for just that single 30- to 40-second period nearly killed us and the Scout crew and nearly destroyed two aircraft.

I learned a valuable lesson that day, not only about crew coordination and communication between crewmembers, but also that personality plays a significant role in determining the thoroughness of a crew briefing. Knowing my copilot's introverted nature outside the cockpit should have sent me a signal. I should have stressed to my new guy that shy behavior and precise cockpit communication is an oxymoron.

We can never assume anything about the other crewmember while flying. When we aren't as precise as possible in communicating thoughts, ideas, and directions, there is a degradation of safety and a sharp increase in potential risk.

In Army aviation, as well as in every aspect of today's society,

there seems to be a decline in understanding between individuals caused by a simple lack of or breakdown in communication. The only way to improve our skills in this area is to practice constantly. Mission pre-briefs and post-briefs are ways to identify and correct deficiencies in communication. Writers,

politicians, and some other professions "live by the word and die by the word." Believe me, aviators can be added to the list of professions that should heed that old axiom. Your life may depend on it!

CW4 Tom Clarke, PA ARNG, DSN 664-3221, ext. 8903 (703-604-3221, ext. 8903).
Reprinted from *Flightfax*, March 1997.

About the Weather

Ask yourself: Even if it's *legal* to go, how *prudent* is it?

What happens if it's right at the limit—just good enough to take off? What if you do take off and then it turns to soup 15 minutes into the mission? What are you going to do now? Can you land where you are and wait it out? What are you going to do if you can't?

What if it gets so bad that you decide to turn around, and there *ain't no turning around*—you bump into the clouds? What are you going to do now? Do you have a plan? Do you have enough fuel? Are you prepared to deal with IMC?

Ask yourself: Am I truly prepared to deal with IMC?

Do you have excellent proficiency? Are you totally prepared? Do you have a plan that you've coordinated with the rest of the aircrew? Have you briefed it? Is the aircraft properly equipped? Do you have nav aids and instrument approaches available? Do you have a coordinated plan to reduce the effects of spatial disorientation should it strike you or another crewmember in inadvertent IMC?

Ask yourself: How bad does it have to get before I say no?

If you are routinely flying in the worst weather that's legal to fly in, it's only a matter of time until you find yourself inadvertently IMC. And if you're not ready—not fully prepared—this could be where the statistics catch up with you and you have an accident. And please remember that accidents resulting from inadvertent IMC situations are *very rarely* minor accidents.

Ask yourself: Is *this* mission worth doing in *this* weather?

Maybe your unit should establish some weather criteria of its own. How much experience does the unit have? Are you a bunch of old-timers who've got a lot of IFR time and are well prepared to deal with IMC? Or are most of you rookies who haven't been inside a cloud since you were with your IP in flight school? Or are you somewhere in between? Maybe you should have different unit minimums that consider not just crew experience but mission criticality as well. And what if you establish ahead of time the level at which go-no-go decisions are made—that if the weather is here, then the decision must be made at this level. In other words, what if you elevate the decision to a level that's consistent with the level of risk?

Sound familiar? Good! That's basic risk management.
And basic good sense.

A call for articles

Looking for your stories for the upcoming October-December issues on the following subjects:

- ✎ Aircrew coordination: Breakdown or success stories
- ✎ Unit Simulator Usage Programs —how does your unit best use the asset?
- ✎ Wire Strikes or Almost-Strikes stories and unit programs to deal with the threat.
- ✎ Cold Weather Operations: What are we missing in our risk assessments?
- ✎ Your In-Flight emergency stories

Don't worry if you think you can't write! The benefit of your story is in the substance—besides, we have editors. Just e-mail it to CPT Garrett at flightfax@safety-emh1.army.mil.

RMIS *The website for Safety Officers and Commanders. Sign up on-line.*
<http://rmis.army.mil>

Update

- New POV page
- Updated Leader's Guides for Korea and Southwest Asia
- Summer Safety Handbook
- Safety classes—ready for you to download.



An appreciative word

We at the US Army Safety Center would like to take a few lines of *Flightfax* to show our appreciation to a dedicated employee. Ms. Sally Yohn has been the *Flightfax* editor and coordinator since October 1996. She developed a tremendous relationship with the field and other DA agencies and catapulted *Flightfax* to a higher standard. In June this year, she accepted a position at the Center for Disease Control as the senior technical writer and editor. For her 28 years of service to the US Army, US Army Safety Center, and especially *Flightfax*, we say, "Thank you, Sally. No one can replace you."

H-60 Anti-Ice Start Bleed Valve HIT checks

Daily Anti-Ice Start Bleed Valves (AISBV) and Health Indicator Test (HIT) checks are a requirement! Sticking AISBVs is the number one cause of T700-GE-700 engine in-flight shutdowns. It is a requirement per the maintenance manual, TM 1-2840-248-23, to perform a daily AISBV check in conjunction with the HIT. The AISBV checks were put in place to verify the valve operability. Potential sticking valves that can cause an in-flight flame out can be identified by indications of an Anti-Ice light illumination and temperature rise/decrease. "Cycling" of the valve to clear a deficient light or temperature indication is not permitted. Valves are to be replaced if any part of the daily AISBV check fails.

Recent experience has revealed that some units either avoid taking corrective action for valves that fail to meet the HIT check requirements or cycle the valve. The practice is against established manual requirements to ground the aircraft until the AISBV problem is corrected. Failure to do this will expose the crew and passengers to an unnecessary potential for an engine flame out. Safety is paramount. Do your HIT checks correctly and reduce In-Flight Shut Downs (IFSDs).

Reprinted from the *Black Hawk Newsletter*, Issue 36, January/February 1999. POC: Mr. Curtis Stevens, DSN 897-4983 (256-313-4983), stevensc@redstone.army.mil

Accident briefs

Information based on preliminary reports of aircraft accidents

AH64



Class C A series

■ Crew experienced unannounced No. 1 engine failure while at 1200' AGL. Aircraft was flying at 130 kts and 85% torque when failure occurred. Rotor speed decreased to approximately 70% before control was regained. No. 2 eng was at upper limit of 130% torque then stabilized within usable limits. Aircraft was landed without further incident. Drive train, to include transmission, was replaced due to overtorque.

■ Aircraft reportedly initiated a series of uncommanded yaws while at an OGE hover. The IP (front seat) took the controls from the pilot-trainer and, as he was attempting to disengage the TADS and engage the PNVIS, the aircraft descended to the ground impact. Both crew members egressed without injury.

D series

■ Aircraft tail boom reportedly contacted raised vegetation while in flight, separating the tail wheel. Crew elected to continue flight to conclusion for assisted (mattress) landing.

■ Aircraft was in cruise flight at 100' AGL and 50 KIAS when APU fire light and audio activated. APU fire handle was deployed and aircraft was landed immediately without further incident. Driveshaft was twisted off and APU showed signs of high temperatures.

Class E A series

■ While at a 140 ft AGL hover with the attitude hover hold engaged, the aircraft had five uncommanded flight control inputs. Each time, the PC cycled the attitude hover hold switch and the DASE switches, while returning the aircraft to the field site assembly area. The aircraft was landed without further incident. Maintenance determined that the DASE computer memory was saturated with data.

D series

■ During cruise flight the primary hyd pressure caution light illuminated on the UFD. This was immediately followed by a BUCS failure warning

and voice message, along with the master warning. The PC landed the aircraft and made an emergency shutdown. Maintenance discovered the pressure line from hydraulic pump to hydraulic manifold had failed.

CH47



Class C D Series

■ Excessive power turbine inlet temperature (PTIT) reading (1000° C) was noted on the No. 1 engine during the conduct of a health indicator test (HIT) check. The No. 1 engine had been stabilized at ground idle while the No. 2 engine was being tested. At some point, as crew was responding to the sudden acceleration of the No. 2 engine, the No. 1 engine came off line and stalled.

Class D D series

■ During a maintenance operational check (MOC), as the engine control levers (ECLs) were advanced from ground (GND) toward flight (FLT), the aircraft began an abnormal lateral vibration. The PC returned the ECLs to GND. Since the lateral vibration was still present, the PC elected to complete a shut down. As the blades slowed, the flight engineer advised the pilot that one of the aft blades was tracking lower than the others. As the rotor rpm reached near zero, the aft yellow (a-y) blade struck the drive shaft cover and upper fuselage.

E series (MH-47E)

■ Right cockpit door separated in flight. Aircraft was landed without further incident. Door could not be located.

Class E D Series

■ Aircraft was on base leg of the traffic pattern during ATM training when the aircraft vibrated severely for about two seconds. The pilot on the controls reported uncommanded inputs to the thrust control. These inputs were up and down oscillations of approximately three inches. The pilot on the controls could not override them, so he landed immediately with

no further incident.

■ During a two-ship formation flight at 30 kts in a left hand turn, chalk 2 reported that the thrust control became difficult to move in either direction. Even with the thrust trigger depressed, the pilot had to override the CCDA clutch in order to move the control. Aircraft was landed in a field site without further incident.

OH58



Class A D Series

■ Crew reported activation of the engine-out audio signal at an estimated altitude of 400 feet (AHO) at approximately 80 kias, followed by the low-rotor audio. Crew initiated autorotation, lowering the collective before the aircraft impacted the ground. The skids spread, and the right skid reportedly caught in the ground, after which the aircraft rolled onto its right side with the blades still operating. Crew was able to egress through the front wind screen.

Class C C Series

■ Turbine gas temperature (TGT) increased during engine start sequence. TGT peaked at 1005° C before engine could be shutdown.

■ Post-flight inspection revealed damage to the tailboom (wrinkling), tail rotor drive shaft (dent), and isolation mount. The crew of the previous mission reported low rotor rpm and vibration on touchdown from a standard autorotation maneuver but suspected no damage.

D Series

■ While on final approach to field site at 10-15 kts, 75-100 ft AGL, the pilot in command (PC) felt a sudden right yaw induced by a minor wind gust. The PC applied left pedal, adjusted collective pitch, and landed the aircraft without further incident. Computer interrogation of the engine electronic control unit (ECU) revealed an engine overtorque of 132.4 percent for 1.54 seconds.

■ On takeoff, crew experienced a series of loud reports and uncommanded right spin. IP initiated

an autorotation and aircraft came to rest upright. Crew reported an overtorque of the engine (reading of 169 percent for 1 second) and damage to the rear landing gear mount.

Class D

C Series

■ During a low-level training autorotation, the OH58C landed tail low and pitched forward, causing suspected spike knock and hard landing. Aircraft was shutdown without further incident.

Class E

A Series

■ Aircrew heard loud bang while enroute at 3500 ft. PI checked aircraft systems along with doors and equipment for possible shifting in flight. Aircraft was landed and shutdown. Inspection revealed a bird strike to the left windscreen, but no damage was found.

UH1



Class E

H Series

■ While on the ground, pilot noticed a smell of hydraulic fluid. The flight engineer found a hydraulic leak on the pitch actuator. Crew performed an emergency engine shutdown. Post-flight inspection revealed a manifold packing had worn out. Manifold packing was replaced and aircraft was returned to service.

UH60



Class C

A Series

■ IP initiated a descending left-hand turn after crossing power lines. The aircraft nose reached 20 degrees nose-low and continued to descend. It contacted tree tops before aircraft responded to corrective control inputs. Aircraft was landed without further incident. Visual inspection revealed damage to left position light, HF antenna, lower anti-collision light, tail wheel actuator, and the stabilator.

L Series (MH-60L)

■ Aircraft was in level flight when PC observed an unidentified object depart the aircraft. No unusual vibrations were evident, but for safety sake, the crew made a precautionary landing to a rearming pad. Post-flight inspection revealed black main rotor

blade anti-flap stop and bracket were missing. Yellow main rotor blade was damaged.

Class E

A Series

■ After normal takeoff, crew detected change in rotor sound and noted engine Np and Nr at 96 percent with all other indications normal. An initial attempt to increase Np with RPM control switch was unsuccessful. A second attempt resulted in normal operation and the crew landed without further incident. Investigation failed to duplicate suspected dual-engine rollback.

■ Aircraft was parked in unimproved field with engines shut down when second aircraft landed next to it. Left cockpit door of parked aircraft was forcefully blown open. An immediate inspection revealed no apparent damage, however, a later inspection revealed that the chin bubble was cracked and door frame was bent.

■ The No. 1 engine flamed out during a maintenance test flight. Crew initiated emergency procedures and was able to restart the engine and land without further incident. The In-flight shut down was caused by an intermittent failure of fuel-control section of the hydro-mechanical unit.

■ During cruise flight at 1000 feet and 110 knots, the crew chief saw a bird fly into the rotor system. The aircraft was landed. No damage was found.

■ Enroute to pickup zone, the aircraft was unable to avoid hitting bird, which impacted below the center windshield. The aircraft was returned to the airfield where an inspection revealed no damage.

■ A grinding sound was heard and the left-hand input module chip light came on during hover. The tower observed oil spraying into the mast and instructed the aircraft to land immediately. The oil spray caused a smoky mist cloud to form, but no other damage. Oil was leaking from the gimbal seal.

■ During a HIT check, the No. 2 engine anti-ice start bleed valve stuck in the open position. The anti-ice light did not go off and TGT did not decrease when No. 2 engine anti-ice was turned off. Flight was aborted.

L series

■ Scratch marks were found on undersides of all four main-rotor blades during post-flight. It is suspected that the blades contacted the ALQ-144.

■ During shutdown, a vibration was felt while the main rotors were slowing down. The crew chief noticed that one droop stop did not completely seat. During the post-flight inspection, a tear was noted in black main rotor elastomeric bearing. Further inspection found damage to spindle thrust bearing, spindle, and hub.

C12



Class C

F series

■ Crew experienced lightning strike while in cruise flight at 29,000 ft AGL. No instrumentation anomalies were noted and flight was continued to destination. Post-flight inspection revealed burn marks/damage to the right wing, right propeller, radar dome, 2 antennas, and left elevator trim tab.

O5



Class E

DHC-7

■ No. 1 fuel quantity indicator went inoperative in flight. Caused by moisture in cannon plug.

■ No. 4 engine T-5 gauge was inoperative following startup. Maintenance replaced T-5 terminal block.

■ Ground crew detected leak from roll spoilers. Maintenance replaced left outboard spoiler pressure hydraulic line.

C35



Class C

■ While landing, after completing a PAR approach, the pilot at the controls allowed the right wing tip of the UC-35 to touch the ground. At the Decision Height (DH), the pilot noticed that the runway was to the left, so a left correction was made. The pilot actually overcorrected left and, then reacted by banking right, just as he flared for landing. The right wing tip touched the runway.

For more information on selected accident briefs, call DSN 558-2785 (334-255-2785). Note: Information published in this section is based on preliminary mishap reports submitted by units and is subject to change.

Aviation messages

Recap of selected aviation safety messages

Aviation safety-action messages

UH-60-99-ASAM-08, 091620Z Jun 99, maintenance mandatory

Revise retirement life of Bellcrank Support Assembly, P/N 70400-08162-042/043/045, manufactured by Air Industries (Cage 8L513).

The Bellcrank Support Assembly, being delivered under production and spares contracts through Sikorsky aircraft company, was manufactured by air industries, an untested source. A reduced life of 5,000 hours must be set on Bellcrank Support Assemblies, P/N 704000-08162-042/045, and a reduced life of 2,200 hours on Bellcrank Support Assembly P/N 70400-08162-043, from Air Industries, Cage 8L513. These reduced lives will hold until the required engineering tests are complete. The subject part is also known as the main support bridge and/or bridge support.

AMCOM Contact: Mr. Ron Price, DSN: 788-2096 (256-842-8643), ron.price@redstone.army.mil

AH-64-99-ASAM-07, 011648Z

Jun 99, maintenance mandatory

One time and recurring torque check inspection of three Tail Rotor Nuts no later than the next 10 hour/14 day inspection.

Upon investigation, it was discovered that the procedures contained in TM 1-1520-238-22 and TM 1-1520-Longbow/Apache IETM (interactive electronic technical manual) are incorrect. Urgent TB 1-1520-238-30-15 dated 07 Dec 1998 was then issued providing correct installation instructions. As a result of field compliance with this TB, there have been reports of properly indexed tail rotor forks having nut(s) that do not pass the torque checks.

No later than the next 10 hour/14 day inspection, perform torque check of the three nuts securing the tail rotor fork to the tail rotor gearbox output shaft. This inspection will reveal insufficiently-torqued nuts and will be repeated at each 250-hour phase inspection.

AMCOM Contact: Mr. Howard Chilton, DSN:897-2068 (256-313-2068), howard.chilton@redstone.army.mil

Safety-of-flight message

SOF-AH-1-99-04, 231840Z JUN 99, maintenance mandatory

Replace T53-L-703 engine non-coated spur gear with coated spur gear not later than 01 December 2000.

The T-53 series engine has experienced a number of N2 spur gear failures that have been attributed to vibration. A SOF was issued to implement a vibration inspection utilizing the AVA test equipment. Aircraft that passed the vibration inspection were released to fly and were required to perform a recurring 25 hour vibration inspection. That has since been extended to 50 hours for aircraft with non-coated spur gears and 150 hours for aircraft with coated spur gears. Those that fail the initial or subsequent vibration inspections are grounded until future corrective action is decided.

A coated spur gear has been developed that attenuates the stresses in the gear to lower levels. This message mandates the installation of coated spur gears in AH-1's that have passed, and continue to pass, the recurring AVA inspection.

AMCOM Contact: Mr. Robert Brock, DSN: 788-8632 (256-842-8632), bob.brock@redstone.army.mil

POV Fatalities through 30 Jun

FY99	FY98	5-yr Avg
97	86	85



HIGH-RISK PROFILE

Age & Rank: 19-23, E1-E4, O1, O2
Place: Two-lane rural roads
Time: Off-duty, 1100-0300
Friday & Saturday nights

TRENDS 1. No seatbelt or helmet 2. Too fast for conditions 3. Fatigue

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FY99 Aviation Accidents through 30 Jun

		Class A	Class B	Class C	Total
ACCIDENTS	Total Avn Acdts	14	10	64	88
	Flight Acct Rate	2.05	1.32	7.18	10.55
RATE COMPARISON	FY99 vs. FY98	20.6 %	113 %	14.1 %	62.5 %
	FY99 vs. 5-yr avg	61.4 %	37.5 %	12.5 %	30.0 %
Aviation Military Fatalities					13



U.S. ARMY SAFETY CENTER

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